

### **AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows:

#### **LISTING OF CLAIMS:**

Claim 1. (Withdrawn) An isolated polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity comprising SEQ ID NO: 1 or a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity and being at least 60% homologous to SEQ ID NO: 1 as determined by the Wisconsin Sequence Analysis Package GCG, Version 9.1 (1997).

Claim 2. (Withdrawn) An isolated polypeptide according to claim 1 wherein the polypeptide is at least 70% homologous to SEQ ID NO: 1.

Claim 3. (Withdrawn) An isolated polypeptide according to claim 1 wherein the polypeptide is at least 80% homologous to SEQ ID NO: 1.

Claim 4. (Withdrawn) An isolated polypeptide according to claim 1 wherein the polypeptide is at least 90% homologous to SEQ ID NO: 1.

Claim 5. (Withdrawn) An isolated polypeptide according to claim 1 which is derived from chicken.

Claim 6. (Currently amended) An isolated nucleic acid sequence encoding a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity comprising SEQ ID NO: 1 or a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity and being at least 80% homologous to SEQ ID NO: 1 as determined by the Wisconsin Sequence Analysis Package GCG, Version 9.1 (1997) ~~the polypeptide of claim 1.~~

Claim 7. (Original) An isolated nucleic acid sequence according to claim 6 which comprises SEQ ID NO: 2 or a fragment thereof.

Claim 8. (Cancelled).

Claim 9. (Cancelled).

Claim 10. (Original) An isolated nucleic acid sequence according to claim 6 wherein the nucleic acid is a deoxyribonucleic acid.

Claim 11. (Currently Amended) An isolated nucleic acid sequence comprising an antisense ribonucleic acid, which binds to the nucleic acid sequence according to claim 6 ~~wherein the nucleic acid is an antisense ribonucleic acid.~~

Claim 12. (Original) A primer for amplifying a gene coding for a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity which primer comprises a fragment of the nucleic acid sequence according to claim 6.

Claim 13. (Original) A probe for detecting a gene coding for a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity which probe comprises a fragment of the nucleic acid sequence according to claim 6.

Claim 14. (Original) A test kit for amplifying and/or detecting a gene or a fragment thereof coding for  $\beta,\beta$ -carotene 15,15'-monooxygenase wherein the test kit comprises at least one primer according to claim 12.

Claim 15. (Original) A test kit for amplifying and/or detecting a gene or a fragment thereof coding for  $\beta,\beta$ -carotene 15,15'-monooxygenase wherein the test kit comprises at least one probe according to claim 13.

Claim 16. (Withdrawn) An antibody which specifically reacts with a polypeptide according to claim 1.

Claim 17. (Withdrawn) An immunoassay for the detection and/or quantification of  $\beta,\beta$ -carotene 15,15'-monooxygenase which comprises at least one antibody according to claim 16.

Claim 18. (Withdrawn) A process for the production of vitamin A comprising enzymatically cleaving  $\beta$ -carotene with a polypeptide according to claim 1.

Claim 19. (Currently amended) A method for introducing a  $\beta,\beta$ -carotene 15,15'-monooxygenase cDNA into a host cell comprising introducing a cDNA coding for a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity comprising SEQ ID NO: 1 or a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity and being at least 80% homologous to SEQ ID NO: 1 as determined by the Wisconsin Sequence Analysis Package GCG, Version 9.1 (1997) ~~the polypeptide of claim 1~~ into a vector suitable for the host cell and introducing the vector into the host cell.

Claim 20. (Original) A method according to claim 19 wherein the host cell is a plant cell.

Claim 21. (Original) A method according to claim 19 wherein the host cell is a prokaryotic cell.

Claim 22. (Original) A method according to claim 19 wherein the host cell is a yeast cell or a fungal cell.

Claim 23. (Original) A method according to claim 19 wherein the host cell is an alga cell.

Claim 24. (Original) A method according to claim 19 wherein the host cell is a mammalian cell.

Claim 25. (Original) A method according to claim 24 wherein the mammalian cell is a human cell.

Claim 26. (Original) A host cell obtained by the method of claim 19.

Claim 27. (Original) A host cell according to claim 26 which comprises a  $\beta,\beta$ -carotene 15,15'-monooxygenase cDNA obtained from another species.

Claims 28-30. (Cancelled).

Claim 31. (Currently amended) A vector comprising a polynucleotide encoding a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity comprising SEQ ID NO: 1 or a polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity and being at least 80% homologous to SEQ ID NO: 1 as determined by the Wisconsin Sequence Analysis Package GCG, Version 9.1 (1997) the polynucleotide of SEQ ID NO: 2.

Claim 32. (Previously amended) A host cell transformed with the vector of claim 31.

Claim 33. (Withdrawn) An isolated polypeptide having  $\beta,\beta$ -carotene 15,15'-monooxygenase activity comprising SEQ ID Nos: 1 or 4.

Application No.: 10/053,192  
Amendment Dated: February 9, 2004  
Reply to Office Action Dated: September 9, 2003

Claims 34-36 (Cancelled).

Claim 37 (New) An isolated nucleic acid sequence according to claim 6, wherein the polypeptide is at least 90% homologous to SEQ ID NO: 1.